Appendix D

Weighting Methodology

Two sets of weights were used in the analyses for this report. One set of weights was developed for the mail survey: This set compensates for differential response rates by facility type and public/private ownership. A second set of weights was developed for data collected during the 95 site visits: This set compensates for the unequal probability of selection during the sampling process.

Mail Survey Weights

The mail survey sample was divided into eight strata for the purpose of weighting: public detention centers, private detention centers, public reception centers, private reception centers, public training schools, private training schools, public ranches, and private ranches. We observed differential response rates to the mail survey in each of these strata (see Chapter 2 for response rates). For example, the highest response rate was for public training schools (89 percent), and the lowest response rate was for private ranches (54 percent).

The nonresponse weight (weight 1) gives greater weight to facilities in the facility type/ownership stratum with lower response rates and less weight to facilities in the stratum with higher response rates. In this instance, private ranches have the largest weights and public training schools have the smallest weights. The nonresponse weights were calculated by dividing the number of facilities in the universe in each stratum by the number of facilities which responded in that stratum. For example, 174 out of 196 public training schools responded to the mail survey. The nonresponse weight for public training schools is 196/174, or 1.1264.

This nonresponse weight increases the sample of facilities up to the universe of facilities, but almost all of the analyses presented in this report are based upon the number of juveniles in confinement, not the number of juvenile facilities. Therefore, we also weighted the mail survey data by the juvenile population, by multiplying the number of juveniles in each facility by the nonresponse rate for facilities in that stratum (weight 2).

However, multiplying the nonresponse weight by the juvenile population artificially inflates the sample size that our statistical software (SPSS) uses when calculating tests of significance. To correct for this problem, we scaled the weights back to the original universe of facilities. The final adjusted weight (weight 3) was calculated by dividing weight 2 for each individual facility by the mean of the weight across all facilities. This calculation brings the weight back to the actual number of facilities, allowing SPSS to calculate tests of significance correctly.

All analyses based on mail survey data which describe the percentage of juveniles in confinement use this final weight. Any analyses which describe the percentage of juvenile facilities use the original nonresponse weight.

Site Visit Weights

The 95 facilities selected for site visits were sampled with a probability proportionate to the population reported in the CIC census (see Chapter 2 for a discussion of the sampling methodology), making it necessary to weight all site visit data to correct for the unequal probability of selection. Five juveniles were randomly selected to be interviewed at each facility in the site visit sample. We calculate

a second site visit weight for juvenile interview data, building upon the weight developed for the 95 facilities visited. Each of these weights is described below.

The first step in weighting the site visit data involved deriving a weight for each sample facility that participated in the study. This weight is equal to the reciprocal of the selection probability of the facility. Facilities are the first-stage sampling units in the design. They were selected using probability proportional to size sampling. The measure of size was the total number of juveniles in the facility.

For each of the four facility type strata (detention centers, reception centers, training schools, and ranches), the sum of the measure of size for all facilities was computed. Call this $MosT_h$, where h references facility stratum. Each sample facility in a stratum was classified as eligible or ineligible, and the ratio of the total measure of size of the eligible sample facilities to the sum of the total measure of size of the eligible and ineligible sample facilities was computed. Call this $E.R._h$. The estimated total measure of size of eligible facilities in a stratum, $MosT'_h$, was then derived from the product of $MosT_h$ and $E.R._h$. The sample weight, Weight 1_{hi}, for each facility participating in the study was then computed from:

$$\text{Weight } 1_{hi} = MosT'_h / (m_h\ Mos_{hi}),$$

where i references facility within facility type stratum, m_h equals the number of participating in the h-th stratum, and MOS_{hi} equals the measure of size of the i-th participating facility in the h-th stratum.

Weight 1_{hi} adjusts for the unequal probability of selection into the site visit sample, but again almost all of the analyses presented in this report are based upon the number of juveniles in confinement, not the number of juvenile facilities. Therefore, we weighted the site visit data by the juvenile population in the same manner as we weighted the mail survey data. All facility-level data from the site visits are weighted by Weight 1, multiplied by the number of juveniles in the facility, divided by the mean of that product.

Five juveniles were randomly selected to be interviewed in each of the 95 facilities visited. The juvenile is the second-stage sampling unit. Juveniles in a participating facility were selected with equal probability. For the i-th participating facility in the h-th stratum, the within facility juvenile weight, Weight 2_{hi}, equals the ratio of the total number of juveniles in the facility to the number of sample juveniles that participated in the study.

At the third and final step of the weighting methodology, the weight of each juvenile that participated in the study was computed as the product of Weight 1_{hi} and Weight 2_{hi}. This weight was used in the analysis of the sample of 475 juveniles that participated in the study. For all analyses, this weight was scaled so that the weighted sample size of participating juveniles equaled the unweighted sample size of 475 juveniles. This scaling was performed in the same way as for the mail survey data and the facility-level site visits data, by dividing the resulting weight by the mean across all facilities.